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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
JONES, CHRISTOPHER P	
ART UNIT	PAPER NUMBER
4132	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,089	FUJIWARA ET AL.	
	Examiner	Art Unit	
	CHRISTOPHER P. JONES	4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20050920, 20051110, 20051128*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Regarding claim 1, lines 2 and 3, the phrase "a plurality of layers mainly composed of polyester-based binder fibers" is indefinite. It is unclear whether each layer is mainly composed of polyester-based binder fibers, or whether the total amount of fibers in the entire filter are mainly polyester-based binder fibers. Furthermore, in light of the limitation "a final fluid outflow side comprises 100% of the polyester-based binder fibers", on lines 6 and 7, it is unclear how the plurality of layers could be mainly composed of polyester-based binder fibers.

4. Also regarding the phrase "a plurality of layers mainly composed of polyester-based binder fibers", it is unclear whether "mainly" means that the majority of the fibers are polyester-based binder fibers, a majority of the weight of the filter is polyester-based binder fibers, or that there are more polyester-based binder fibers, or more weight in polyester-based binder fibers, than any other type of fiber.

5. Regarding claim 1, line 3, the phrase "polyester-based binder fibers having a fiber length of 1 to 10 mm" is indefinite. It is unclear whether some the polyester-based

binder fibers have fibers lengths of 1 to 10 mm, whether all of the polyester-based binder fibers have fiber lengths of 1 to 10 mm, or whether the average polyester-based binder fiber has a fiber length of 1 to 10 mm.

6. Regarding claim 1, lines 4 and 5, the phrase “upper layer side (fluid inflow side)” is indefinite. It is unclear whether this phrase is requiring the upper layer side to have a fluid inflow, or whether the fluid inflow is an intended use of the upper layer side.

7. Regarding claim 1, lines 5 and 6, the phrase “lower layer side (fluid outflow side)” is indefinite. It is unclear whether this phrase is requiring the lower layer side to have a fluid outflow, or whether fluid outflow is an intended use of the lower layer side.

8. Regarding claim 1, line 6, the phrase "a final fluid outflow side" is indefinite. It is unclear whether this side must have a fluid outflow, or whether fluid outflow is an intended use of this side. Furthermore, it is unclear whether the "final fluid outflow side" encompasses part of the lower layer side, all of the lower layer side, or none of the lower layer side.

9. Regarding claim 1, lines 6 and 7, the phrase “a final fluid outflow side comprises 100% of the polyester-based binder fibers” is indefinite. It is unclear whether the final fluid outflow side is composed of nothing but polyester-based binder fibers, whether the final fluid outflow side contains 100% of the polyester-based binder fibers in the filter, or both. Furthermore, it is unclear where the “final fluid outflow side" is positioned with respect to the other layers. It is unclear whether the “final fluid outflow side” includes the "lower layer side (fluid outflow side)", is the same as the “lower layer side (fluid outflow

side)", is included by the "lower layer side (final outflow side)", or is completely separate from the "lower layer side (fluid outflow side)".

10. Regarding claim 1, line 7, the phrase "the basis weight (METSUKE) is from 100 to 350 g/m^2" is indefinite. It is unclear whether "the basis weight (METSUKE)" is referring to the basis weight per unit area of the entire filter, the air-laid nonwoven fabric, or the final fluid outflow side.

11. Regarding claim 1, lines 7 and 8, the phrase "the apparent density is from 0.04 g/cm^3 to 0.3 g/cm^3" is indefinite. It is unclear whether "the apparent density" is referring to the apparent density of the entire filter, the air-laid nonwoven fabric, the final fluid outflow side, or the polyester-based binder fibers.

12. Regarding claim 1, line 8, the phrase "the dry-heat shrinkage factor after 300 hours at 100 degrees C is 3% or less" is indefinite. It is unclear whether the "dry-heat shrinkage factor" is referring to the dry-heat shrinkage factor of the entire filter, the air-laid nonwoven fabric, the final fluid outflow side, or the polyester-based binder fibers.

13. Claim 2 recites the limitation "the large-fiber layer" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

14. Claim 2 recites the limitation "the fine-fiber layer" in line 5. There is insufficient antecedent basis for this limitation in the claim.

15. Regarding claim 2, line 2, the phrase "a fiber diameter of 20 to 45 micrometers ... in the large-fiber layer on the upper layer side" is indefinite. It is unclear whether some of the fibers in the large-fiber layer have fiber diameters of 20 to 45 micrometers, whether all of the fibers in the large-fiber layer have fiber diameters of 20 to 45

micrometers, whether the average fiber in the large-fiber layer has a fiber diameter of 20 to 45 micrometers, whether some of the large fibers in the large-fiber layer have fiber diameters of 20 to 45 micrometers, whether all of the large fibers in the large-fiber layer have fiber diameters of 20 to 45 micrometers, or whether the average large fiber in the large-fiber layer has a fiber diameter of 20 to 45 micrometers.

16. Regarding claim 2, lines 3-4, the phrase "a fiber diameter of 15 to 30 micrometers ... in an intermediate layer" is indefinite. It is unclear whether some of the fibers in the intermediate layer have a fiber diameter of 15 to 30 micrometers, whether all the fibers in the intermediate layer have fiber diameters of 15 to 30 micrometers, or whether the average fiber in the intermediate layer has a fiber diameter of 15 to 30 micrometers.

17. Regarding claim 2, lines 4 and 5, the phrase "a fiber diameter of 7 to 20 micrometers ... in the fine-fiber layer on the lower layer side" is indefinite. It is unclear whether some of the fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether the average fiber in the fine-fiber layer has a fiber diameter of 7 to 20 micrometers, whether some of the fine fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fine fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, or whether the average small fiber in the fine-fiber layer has a fiber diameter of 7 to 20 micrometers.

18. Claim 3 recites the limitation "the large-fiber layer" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

19. Claim 3 recites the limitation "the fine-fiber layer" in line 6. There is insufficient antecedent basis for this limitation in the claim.

20. Regarding claim 3, lines 2 and 3, the phrase "a fiber diameter of 25 to 50 micrometers ... in the large-fiber layer on the upper side" is indefinite. It is unclear whether some of the fibers in the large-fiber layer have fiber diameters of 25 to 50 micrometers, whether all of the fibers in the large-fiber layer have fiber diameters of 25 to 50 micrometers, whether the average fiber in the large-fiber layer has a fiber diameter of 25 to 50 micrometers, whether some of the large fibers in the large-fiber layer have fiber diameters of 25 to 50 micrometers, whether all of the large fibers in the large-fiber layer have fiber diameters of 25 to 50 micrometers, or whether the average large fiber in the large-fiber layer has a fiber diameter of 25 to 50 micrometers.

21. Regarding claim 3, lines 3-4, the phrase "a fiber diameter of 20 to 35 micrometers ... in an intermediate layer" is indefinite. It is unclear whether some of the fibers in the intermediate layer have a fiber diameter of 20 to 35 micrometers, whether all the fibers in the intermediate layer have fiber diameters of 20 to 35 micrometers, or whether the average fiber in the intermediate layer has a fiber diameter of 20 to 35 micrometers.

22. Regarding claim 3, lines 4 and 5, the phrase "a fiber diameter of 7 to 20 micrometers ... in a finer-fiber layer on the lower layer side" is indefinite. It is unclear whether some of the fibers in the finer-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fibers in the finer-fiber layer have fiber diameters of 7 to 20 micrometers, whether the average fiber in the finer-fiber layer has a fiber diameter of

7 to 20 micrometers, whether some of the fine fibers in the finer-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fine fibers in the finer-fiber layer have fiber diameters of 7 to 20 micrometers, or whether the average small fiber in the finer-fiber layer has a fiber diameter of 7 to 20 micrometers.

23. Regarding claim 3, lines 5 and 6, the phrase "a fiber diameter of 7 to 20 micrometers ... in the fine-fiber layer of the lowest layer" is indefinite. It is unclear whether some of the fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether the average fiber in the fine-fiber layer has a fiber diameter of 7 to 20 micrometers, whether some of the fine fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, whether all of the fine fibers in the fine-fiber layer have fiber diameters of 7 to 20 micrometers, or whether the average small fiber in the fine-fiber layer has a fiber diameter of 7 to 20 micrometers.

24. Regarding claim 3, line 5, the phrase "in a finer-fiber layer on a lower layer side" is indefinite. It is unclear whether or not "a lower layer side" is the same lower layer side as referred to in claim 1, line 5. Furthermore, it is unclear whether or not the finer-fiber layer can be the same layer as the "fine-fiber layer", or whether it must be a separate layer.

25. Regarding claim 3, line 6, the phrase "in the fine-fiber layer of the lowest layer" is indefinite. It is unclear whether or not the "lowest layer" is the same layer as the "lower layer side".

26. Regarding claims 4, 8, and 9, the phrase "in which two or more of the air filters ... are further compounded" is indefinite. It is unclear whether the two or more air filters are compounded to each other, or compounded to something else.

27. Regarding claims 6, and 13-16, the phrase "wherein other fibers are blended with the polyester-based binder fibers in the layers other than the final fluid outflow side" is indefinite. It is unclear whether or not this language is limiting the final fluid outflow side to only include polyester-based binder fibers. Furthermore, in light of the limitation "a final fluid outflow side comprises 100% of the polyester-based binder fibers", of claim 1, line 6, it is unclear how other fibers could be blended with the polyester-based binder fibers in the layers other than the final fluid outflow side. If the final fluid outflow side comprises 100% of the polyester-based binder fibers, the other layers necessarily must comprise 0% of the polyester-based binder fibers; therefore, it is unclear how those other layers could blend other fibers with polyester-based binder fibers.

28. Regarding claims 7, and 17-20, the phrase "the filter ... which is compounded with another air-permeable sheet" is indefinite. It is unclear whether or not the "another air-permeable sheet" is required to be a materially different air-permeable sheet than the filter.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

30. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

31. Claims 1-4, 6-9, and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nakajima* USPN 6,991,113 B2, in view of *Terakawa* USPN 5,733,635, in further view of *Amsler* USPN 6,267,252 B1.

32. Regarding claim 1, *Nakajima* discloses a nonwoven fabric (column 2, lines 35-36) with a pleated form (column 8, lines 28-29) which comprises a nonwoven fabric obtained by forming a plurality of layers (column 2, lines 42-44) mainly composed of polyester-based binder fibers (column 4, lines 66-67; column 5, line 1; column 9, table 1: "polyester/[low melting point] polyester"). *Nakajima* discloses the performing of heat adhesion (column 6, lines 47-49). *Nakajima* discloses that the fabric has an upper layer side comprises large fibers (columns 9-10, Table 1: "No. 1, inlet-side layer, Average denier 5.0"), a lower layer side comprises fine fibers (columns 9-10, Table 1: "No. 1, outlet-side layer, Average denier 1.625"), a final fluid outflow side comprises 100% of polyester-based binder fibers (column 9, lines 47-55), the average basis weight (METSUKE) of the three layers is approximately 107 g/m^2 (column 10, Table 1, "No. 1" average of outlet-side layer (170), middle layer (90), and inlet-side layer (60)), 107 g/m^2

is encompassed by the range of 100 to 350 g/m^2. *Nakajima* discloses that the disclosed filter could be used for internal combustion engines (column 2, lines 35-41).

33. *Nakajima* does not expressly state that the apparent density is from 0.04 g/cm.sup.3 to 0.3 g/cm.sup.3.

34. *Terakawa* discloses a non-woven (column 2, lines 2-3) filter (see *Terakawa* column 8, line 15), with an apparent density between about 0.025 to 0.40 g/cm^3 (see *Terakawa* column 8, lines 12-16), which encompasses the range of 0.04 to 0.3 g/cm^3, which yields a filter with high strength and high resistance against falling off of fibers (see *Terakawa* column 2, lines 1-7).

35. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the nonwoven fabric air filter, of *Nakajima*, with the fibers with an apparent density between about .025 to .40 g/cm^3, of *Terakawa*, which encompasses the range of 0.04 to 0.3 g/cm^3, for the purpose of making a filter with a high strength and high resistance against falling off of fibers. A filter with high strength and high resistance against falling off of fibers is desirable because the filter will be able to hold up better over time.

36. *Nakajima* does not expressly state that the polyester-based binder fibers have a fiber length of 1 to 10 mm.

37. *Amsler* discloses a multilayered filter (see *Amsler* figure 12) with polyester-based binder fibers (column 5, lines 9-13) having a fiber length of about 4 to 8 mm (see *Amsler* column 5, lines 61-62), which is encompassed by the range of 1 to 10 mm, for the purpose of allowing even dispersion of fibers (see *Amsler* column 5, lines 56-59)

38. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the nonwoven fabric air filter, of *Nakajima* in view of *Terakawa*, with the polyester-based binder fibers having a fiber length of about 4 to 8 mm, which is encompassed by the range of 1 to 10 mm, of *Amsler*, for the purpose of allowing even dispersion of fibers.

39. *Nakajima* in view of *Terakawa* does not explicitly disclose that the polyester-based binder fibers are from an air-laid nonwoven fabric production process.

40. *Amsler* discloses a multilayered air-laid filter (see *Amsler* figure 12) with polyester-based binder fibers (see *Amsler* column 5, lines 9-13) from an air-laid nonwoven fabric production process (see *Amsler* column 9, lines 7-15), for the purpose of allowing thorough bonding between polyester fibers and other fibers (see *Amsler* column 9, lines 24-35).

41. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the nonwoven fabric air filter, of *Nakajima* in view of *Terakawa*, with the polyester-based binder fibers from an air-laid nonwoven fabric production process, of *Amsler*, for the purpose of allowing thorough bonding between polyester fibers and other fibers, which yields a stronger fabric material.

42. *Nakajima*, in view of *Terakawa*, in further view of *Amsler* does not expressly state that the fabric has a dry-heat shrinkage factor after 300 hours at 100 degrees C of 3% or less. Nevertheless, *Nakajima*, in view of *Terakawa*, in further view of *Amsler* discloses a filter with the same preferred structure as contained in Applicant's claims/specification. *Nakajima* discloses a layered filter with the same component,

polyester (column 4, lines 66-67; column 5, line 1; column 9, table 1: "polyester/[low melting point] polyester"), as that found in Applicant's specification, with the same basis weight (columns 9 and 10, Table 1, "Metsuke (g/m^2)"). *Amsler* discloses polyester-based binder fibers (see *Amsler* column 5, lines 9-13), having a fiber length of about 4 to 8 mm (see *Amsler* column 5, lines 61-62) from an air-laid nonwoven fabric production process (see *Amsler* column 9, lines 7-15). Therefore, it is inherent that the filter of *Nakajima*, in view of *Terakawa*, in further view of *Amsler* has a dry-heat shrinkage factor after 300 hours at 100 degrees C of 3% or less. See MPEP 2112.

43. Regarding claim 2, *Nakajima* discloses a basis weight of 60 g/m^2, which is included in the range of 10 to 75 g/m^2, in the large-fiber layer on the upper layer side (columns 9 and 10, Table 1, "No. 1"), a basis weight of 90 g/m^2, which is included in the range of 20 to 105 g/m^2 in an intermediate layer (columns 9 and 10, Table 1, "No. 1"), and a basis weight of 170 g/m^2, which is included in the range of 70 to 170 g/m^2 in the fine-fiber layer on the lower layer side (columns 9 and 10, Table 1, "No. 1").

44. *Nakajima* does not expressly state a fiber diameter of 20 to 45 .mu.m in the large-fiber layer on the upper layer side, a fiber diameter of 15 to 30 .mu.m in an intermediate layer, and a fiber diameter of 7 to 20 .mu.m. However, *Nakajima* discloses that the fiber diameter is largest in the large-fiber layer, and the smallest in the fine-fiber layer (columns 9 and 10, Table 1, "No. 1", "average denier"). *Nakajima* also discloses that the decreasing of the fiber density improves cleaning efficiency (column 1, lines 46-48), but decreases the life span of the filter (column 1, lines 59-61). Therefore, the exact fiber diameter is deemed to be a result effective variable with regard to the cleaning

efficiency and life span of the filter. It would require routine experimentation to determine the optimum value of a result effective variable, such as apparent density, in the absence of a showing of criticality in the claimed filter. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). One of ordinary skill in the art would have been motivated by *Nakajima* to optimize the fiber diameter in order to find an acceptable balance between cleaning efficiency and life span.

45. Regarding claim 3, *Nakajima* does not expressly state a fourth layer comprising a finer-fiber layer on the lower layer side. However, *Nakajima* discloses that the nonwoven fabric is constructed by two or more different kinds of fibrous layers placed one over the other (column 2, lines 42-44). "[T]wo or more ... layers" includes four layers. *Nakajima* also discloses a filter media with layers where the density of each layer is increased stepwise in the stacked direction of the fibrous layers from one source of the nonwoven fabric to the opposite surface (column 1, lines 33-37). Therefore, the exact number of layers of the filter is deemed to be a result effective variable with regard to the filtration efficiency and pressure loss of the filter. It would require routine experimentation to determine the optimum value of a result effective variable, such as the number of layers, in the absence of a showing of criticality in the claimed filter. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). One of ordinary skill in the art would have been motivated by *Nakajima* to optimize the number of layers in order to find an acceptable balance between filtration efficiency and pressure loss of the filter.

46. *Nakajima* does not expressly state a fiber diameter of 25 to 50 .mu.m and a basis weight of 5 to 50 g/m^2 in the large-fiber layer on the upper layer side, a fiber diameter of 20 to 35 .mu.m and a basis weight of 15 to 70 g/m^2 in an intermediate layer, a fiber diameter of 15 to 25 .mu.m and a basis weight of 30 to 90 g/m^2 in a fine-fiber layer on a lower layer side, and a fiber diameter of 7 to 20 .mu.m and a basis weight of 50 to 140 g/m^2 in the fine-fiber layer of the lowest layer. However, *Nakajima* discloses that the fiber diameter is largest in the large-fiber layer, and the smallest in the fine-fiber layer (columns 9 and 10, Table 1, "No. 1", "average denier"), and the basis weight is smallest in the large-fiber layer, and greatest in the fine-fiber layer (columns 9 and 10, Table 1, "No. 1", "Metsuke". *Nakajima* also discloses that the decreasing of the fiber density, and therefore increasing basis weight, improves cleaning efficiency (column 1, lines 46-48), but decreases the life span of the filter (column 1, lines 59-61). Therefore, the exact fiber diameter, and basis weight, of the filter are deemed to be result effective variables with regard to the cleaning efficiency and life span of the filter. It would require routine experimentation to determine the optimum value of result effective variables, such as apparent density and basis weight, in the absence of a showing of criticality in the claimed filter. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). One of ordinary skill in the art would have been motivated by *Nakajima* to optimize the fiber diameter, and basis weight, in order to find an acceptable balance between cleaning efficiency and life span.

47. Regarding claims 4, 7-9, and 17-20, *Nakajima* does not expressly state two or more air filters compounded together. However, it would have been obvious to one

having ordinary skill in the art at the time the invention was made to compound two or more air filters together, both being air-permeable sheets, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. MPEP 2144.04. One of ordinary skill in the art would have been motivated to compound two or more air filters together in order to increase the size of the filter and therefore increase the amount of gas that the filter is capable of filtering at once.

48. Regarding claims 6, and 13-16, *Nakajima* does not explicitly disclose that other fibers are blended with the polyester-based binder fibers in the layers other than the final fluid outflow side.

49. *Amsler* discloses a multilayered air-laid filter (see *Amsler* figure 12) with polyester-based binder fibers (see *Amsler* column 5, lines 9-13) blended with pulp fibers (see *Amsler* column 3, lines 54-57), for the purpose of decreasing the cost of producing the filter, as polyester fibers are more expensive than pulp fibers (see *Amsler* column 5, lines 47-48).

50. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the nonwoven fabric air filter, of *Nakajima* in view of *Terakawa*, with the pulp fibers, of *Amsler*, for the purpose of decreasing the cost of producing the filter.

51. Claims 5 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Nakajima* USPN 6,991,113 B2, in view of *Terakawa* USPN 5,733,635, in further

view of *Amsler* USPN 6,267,252 B1, and in further view of *Fraser* USPA 2003/0084788 A1.

52. *Nakajima* in, view of *Amsler*, in further view of *Terakawa* is relied upon as above.

53. Regarding claims 5, and 10-12, *Nakajima* in, view of *Amsler*, in further view of *Terakawa* does not explicitly disclose that the filter has water repellency.

54. *Fraser* discloses a multilayered filter (see *Fraser* figure 1a) that is treated with a water repellent (see *Fraser* page 4, paragraph 64, lines 1-3).

55. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the nonwoven fabric air filter, of *Nakajima* in, view of *Amsler*, in further view of *Terakawa*, with the water repellent, of *Fraser*, for the purpose of having a filter that repels water and thus prevents it from entering the filter and compromising the integrity and filtration performance of the filter.

Conclusion

56. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER P. JONES whose telephone number is (571)270-7383. The examiner can normally be reached on Monday - Thursday, 8:00 AM - 5:00 PM.

57. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lavilla can be reached on (571)272-1539. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

58. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. P. J./
Christopher P. Jones
Examiner, Art Unit 4132

/Alicia Chevalier/
Primary Examiner, Art Unit 1794